A contribution to the knowledge of the Sphingidae of North India (Insecta, Lepidoptera)

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Abstract: The authors list 23 species of Sphingidae collected in Himachal Pradesh and Meghalaya (N India). For each species range and food plant information is also given.

Ein Beitrag zur Kenntnis der Sphingidae Nordindiens (Insecta, Lepidoptera)

Zusammenfassung: Die Autoren listen 23 Arten von Sphingidae aus Himachal Pradesh und Meghalaya (Nordindien) auf. Es werden für jede der Arten die geographische Verbreitung und ihre Raupenfutterpflanzen angegeben.

Introduction

Among 52 specimens of Sphingidae (Insecta, Lepidoptera) collected in North India by Prof. A. M. SIMONETTA (Dipartimento di Biologia Animale e Genetica, Università di Firenze), by Dr. J. M. JULKA (High Altitude Station, Zoological Survey of India, Solan, H.P.), by Prof. B. LANZA (Museo Zoologico "La Specola", Università di Firenze), by Mr. K. WERNER (Peiting, Germany) and by one of the authors (L. BARTOLOZZI) were 18 genera and 23 species. Their study was particularly interesting due to the precision with which the collecting areas had been pinpointed together with information on the environmental conditions at the time of collection.

Systematic account

Only papers published after BELL & SCOTT (1937) are quoted for each species; we also list the locality data of each specimen and the distribution based on the foregoing quotations. The material is deposited in the collections of the Zoological Museum "La Specola" of the University of Florence; some duplicates of the material collected by Prof. A. M. SIMONETTA and Dr. J. M. JULKA will be deposited in the collections of the Zoological Survey of India.

[1] Dr Angelo BORTOLIN untimely deceased the 25th September 1995. This paper is dedicated to his memory.
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Agrius convolvuli (LINNÉ, 1758)

1 ♀, NE India: Meghalaya, East Khasi Hills, Mawphlang (1500 m), 25. VI. 1995, leg. L. BARTOLOZZI & K. WERNER (at light).

This is a migratory species widespread in the Old World, except for the higher and lower latitudes (D'ABRERA 1986). In India it occurs both in wet and dry areas, up to 2300 m. Foodplants are mainly Convolvulaceae and Fabaceae (BELL & SCOTT 1937).

Acherontia styx (WESTWOOD, 1848)

1 ♂, 1 ♀, NE India: Meghalaya, East Khasi Hills, Mawphlang (1500 m), 25. VI. 1995, leg. L. BARTOLOZZI & K. WERNER (at light).

This is an oriental species that is also found in part of the Australian region: Moluccas, New Guinea, and in the eastern part of the Palaearctic region: China, Japan, Borneo, with the subspecies *medusa* Butler, 1877 (D'ABRERA 1986, HOLLOWAY 1987). The nominotypical subspecies is found in India, Myanmar (Burma) and Sri Lanka as well as in Irak and Saudi Arabia (BELL & SCOTT 1937, WILTSHIRE 1980, 1986, HARUTA 1992, 1994). The species has also been imported in Transvaal (BRYK 1944). The larva feeds on many plants of the families Solanaceae, Verbenaceae, Fabaceae, Oleaceae, Bignoniaceae, Lamiaceae. In India it is sometimes a pest of the crops of *Sesamum indicum* (Pedaliaceae) (BELL & SCOTT 1937).

Meganoton analis (FELDER, 1874)

2 ♀♀, NE India: Meghalaya, East Khasi Hills, Mawphlang (1500 m), 25. VI. 1995, leg. L. BARTOLOZZI & K. WERNER (at light).

This species occurs in montainous areas of northern India: Darjeeling, Khasi Hills (BELL & SCOTT 1937). In addition to India it is found in Myanmar (Burma), Thailand, Malaysia, Sumatra, Borneo, China, and Taiwan (D'ABRERA 1986, HOLLOWAY 1987, HARUTA 1992, 1994). The larva feeds on *Sassafras tzuma* (Lauraceae).

Ambulyx sericeipennis agana (JORDAN, 1929)

1 ♀, NE India: Meghalaya, East Khasi Hills, Mawphlang (1500 m), 25. VI. 1995, leg. L. BARTOLOZZI & K. WERNER (at light); 1 ♂, NE India: Meghalaya, East Khasi Hills, surrounding of Umloi (950 m), about 20 km NE Shillong, 28.-29. VI. 1995, leg. L. BARTOLOZZI & K. WERNER (at light).

JORDAN (1929) described the population of Khasi Hills (Assam) as ssp. *agana*. According to D'ABRERA (1986) the great individual variability of the species does not justify the separation of this taxon. He places *agana* in syn-

onymy of *sericeipennis* (BUTLER, 1875). According to HARUTA (1992), the Nepalese population is intermediate between the nominotypical subspecies and ssp. *agana*. The species inhabits the West and East Himalaya as well as Myanmar (Burma), Peninsular Malaysia and Japan. BELL & SCOTT (1937) found it common in the Khasi Hills, the larvae feeding on *Rhus insignia* (Anacardiaceae), *Juglans regia* and *Engelhardtia spicata* (Juglandaceae), *Myrica nagi* (Myricaceae), *Betula alnoides* (Betulaceae), *Quercus* sp. (Fagaceae).

Ambulyx ochracea (BUTLER, 1885)

1 ♀, NE India: Meghalaya, East Khasi Hills, Mawphlang (1500 m), 25. VI. 1995, leg. L. BARTOLOZZI & K. WERNER (at light).

The species ranges from East Himalaya to China and Japan. In China the food plant is *Poupartia fordii* (Anacardiaceae) (BELL & SCOTT 1937).

Marumba dyras dyras (WALKER, 1856)

1 ♀, N India: Himachal Pradesh, Mandi, Kara forest, Hanogi (31°41' N, 77°07' E) (650 m), 27.-28. VII. 1990, leg. A. M. SIMONETTA; 1 ♀, N India: Himachal Pradesh, Mandi, Kothi Rest House (32°19' N, 77°11' E) (2521 m), 11.-14. VIII. 1986, leg. A. M. SIMONETTA & J. JULKA.

The nominotypical subspecies is widely distributed from North India to Sri Lanka, Myanmar (Burma), Indo China and China (D'ABRERA 1986). The species is well distributed in northern India, where it appears to be common especially in wooded and rainy areas. The larva feeds on *Bombax* (Malvaceae), *Sterculia* (Sterculiaceae), *Grewia* (Tiliaceae), *Bridelia* (Euphorbiaceae), *Schleichera trijuga* (Sapindaceae) (BELL & SCOTT 1937).

Clanidopsis exusta (BUTLER, 1875)

2 ♀♀, N India: Himachal Pradesh, Mandi, Kothi Rest House (32°19' N, 77°11' E) (2521 m), 11.-14. VIII. 1986, leg. A. M. SIMONETTA & J. JULKA; 1 ♀, N India: Himachal Pradesh, Mandi, Kara Forest (31°41' N, 77°07' E) (650 m), 2.-3. VIII. 1986, leg. A. M. SIMONETTA & J. JULKA; 1 ♀, N India: Himachal Pradesh, Chamba distr., Bharmour, leg. A. M. SIMONETTA & J. JULKA; 1 ♀, N India: Himachal Pradesh, Tissa, Bhanjaroo (2000 m, degraded pine-tree forest), 15.-16. VII. 1986, leg. A. M. SIMONETTA & J. JULKA.

This mountain species is confined to northwestern India (Siwalik Range: Kulu, Simla, Chamba, Mussooree) (BELL & SCOTT 1937, D'ABRERA 1986) and Nepal (HARUTA 1992). It lives on *Indigofera* (Fabaceae). The caterpillar remains for a long period buried in the ground (up to nine months) before pupating (BELL & SCOTT 1937).

Daphnis hypothous hypothous (CRAMER, 1780)

2 ♀♀, NE India: Meghalaya, East Khasi Hills, surrounding of Umloi (about 950 m), about 20 km NE Shillong, 28.–29. VI. 1995, leg. BARTOLOZZI & WERNER (at light).

The nominotypical subspecies is widespread in the Oriental region: E Himalaya, S India, Sri Lanka, Myanmar (Burma), Malaysia, China as well as in the northern Australian region: Moluccas, Kai Islands. Another subspecies, *pallescens* Butler, 1875, lives in New Guinea and Solomon Islands. The foodplants in India belong to the family Rubiaceae: *Uncaria, Cinchona, Wendlandia paniculata* (BELL & SCOTT 1937). The species occurs mainly in wooded and rainy areas.

Ampelophaga khasiana ROTHSCHILD, 1895

2 ♂♂, 1 ♀, NE India: Meghalaya, East Khasi Hills, Mawphlang (1500 m), 25. VI. 1995, leg. L. BARTOLOZZI & K. WERNER (at light).

The species is known from E Himalaya (Khasi Hills, Sikkim), Nepal (HARUTA 1992), China (BELL & SCOTT 1937) and Malaysia (ssp. *malayana* ROTHSCHILD & JORDAN, 1915) (D'ABRERA 1986). The species is not common; it inhabits dense forest areas, especially in the rainy months. The larva feeds on *Vitis* (Vitaceae) and *Saurauia nepalensis* (Ternstroemiaceae) (BELL & SCOTT 1937).

Acosmeryx sericeus (WALKER, 1856)

1 ♂, NE India: Meghalaya, East Khasi Hills, surrounding of Umloi (about 950 m), about 20 km NE Shillong, 28.–29. VI. 1995, leg. BARTOLOZZI & WERNER (at light).

This is a rare species living in northern India, Sikkim, Bhutan, Assam, the Philippines (D'ABRERA 1986) as well as in Nepal (HARUTA 1994). The early stages are not known (BELL & SCOTT 1937).

Acosmeryx anceus subdentata ROTHSCHILD & JORDAN, 1903

1 ♀, NE India: Meghalaya, East Khasi Hills, surrounding of Umloi (950 m), about 20 km NE Shillong, 28.–29. VI. 1995, leg. L. BARTOLOZZI & K. WERNER (at light); 1 ♂, N India: Himachal Pradesh, Mandi, Kothi Rest House (32°19' N, 77°11' E) (2521 m), 11.–14. VIII. 1986, leg. A. M. SIMONETTA & J. JULKA; 1 ♀, N India: Himachal Pradesh, Mandi, Kara Forest (31°41' N, 77°07' E) (650 m), 2.–3. VIII. 1986, leg. A. M. SIMONETTA & J. JULKA.

The ssp. *subdentata* is found in rainforests and widespread from northern India to Malaysia, Indonesia and the Philippines. The nominotypical subspecies *anceus* MOORE, 1865 lives in the Australian region: Moluccas, New Guinea and Queensland (D'ABRERA 1986). Foodplants in India are *Vitis indica* and *Leea* (Vitaceae) (BELL & SCOTT 1937).

Eupanacra metallica anfracta GEHLEN, 1930

1 ♀, N India: Himachal Pradesh, Barot (32°02' N, 76°50' E) (1850 m, grassland and cultivations close to forest), 29. VII. 1986, leg. A. M. SIMONETTA & J. JULKA.

This subspecies is the most common *Eupanacra* during the monsoon months in western Himalaya, where it appears to be confined (Mussooree, Simla). The nominotypical subspecies *metallica* BUTLER, 1875 of the eastern Himalaya (Nepal, Sikkim, Bhutan, Assam), in contrast, is rare. The larva feeds on *Arisaema curvatum* (Araceae) (BELL & SCOTT 1937).

Eupanacra mydon (WALKER, 1856)

1 ♀, NE India: Meghalaya, East Khasi Hills, surrounding of Umloi (950 m), about 20 km NE Shillong, 28.-29. VI. 1995, leg. L. BARTOLOZZI & K. WERNER (at light).

The species is common in the rainy season in eastern Himalaya, Myanmar (Burma), Malaysia, and extending to Indonesia and Philippines (ssp. *elegantulus* HERRICH-SCHÄFFER, 1856). The larva feeds on various plants of the family Araceae, like *Colocasia antiquorum, Amorphophallus, Caladium, Arisaema curvatum* (BELL & SCOTT 1937).

Nephele hespera (FABRICIUS, 1775)

2 ♀♀ (f. *didyma*), 1 ♀ (f. *hespera*), NE India: Meghalaya, East Khasi Hills, Mawphlang (1500 m), 25. VI. 1995, leg. BARTOLOZZI & WERNER (at light); 1 ♀ (f. *hespera*), NE India: Meghalaya, East Khasi Hills, surrounding of Umloi (950 m), about 20 km NE Shillong, 28.-29. VI. 1995, leg. BARTOLOZZI & WERNER (at light); 1 ♀ (f. *hespera*), N India: Himachal Pradesh, Piplughat (31°14' N, 76°55' E) (1000 m, mixed deciduous-pine forest), 9. VIII. 1990, leg. SIMONETTA; 1 ♀, N India: Himachal Pradesh, Mandi, Kara Forest (650 m), 2.-3. VIII. 1986, leg. SIMONETTA & JULKA.

This species occurs in two forms: *didyma* FABRICIUS, 1775, with two silvery spots at the end of the forewing cell, and *hespera*, in which these spots are lacking. It is a common species, extending from India, Myanmar (Burma), Sri Lanka to the Andamans, Malaysia, Java. It feeds on various plants of the genus *Carissa* (Apocynaceae), especially *C. carandas* (BELL & SCOTT 1937).

Macroglossum belis (LINNÉ, 1758)

1 ♂, 3 ♀♀, NE India: Meghalaya, East Khasi Hills, Mawphlang (1500 m), 25. VI. 1995, leg. L. BARTOLOZZI & K. WERNER (at light).

This large Old World genus is represented in India by at least 26 species. *M. belis* is common throughout India, Nepal, Sri Lanka, China and Japan to Thailand. It lives both in forest and open country, the larva feeding on *Saprosoma indicum, Hamiltonia suaveolens* (Rubiaceae) and *Strychnos nuxvomica* (Loganiaceae) (BELL & SCOTT 1937).

Deilephila elpenor macromera (BUTLER, 1875)

1 ♂, 1 ♀, NE India: Meghalaya, East Khasi Hills, Mawphlang (1500 m), 25. VI. 1995, leg. L. BARTOLOZZI & K. WERNER (at light).

This species ranges from the Palaearctic to the Oriental region with three subspecies. Ssp. *elpenor* LINNÉ, 1758 is distributed from Europe to northern Iran and eastern Siberia, ssp. *lewisi* BUTLER, 1875 flies in China, Japan, Korea and Taiwan, ssp. *macromera* is known from N India, Assam, Nepal and Myanmar (Burma) (D'ABRERA 1986, HARUTA 1992, 1994). It is very common in the Khasi Hills. The caterpillar feeds on *Arisaema* and *Amorphophallus* (Araceae), as well as on *Impatiens* (Balsaminaceae) (BELL & SCOTT 1937).

Hippotion celerio (LINNÉ, 1758)

2 ♀♀, NE India: Meghalaya, East Khasi Hills, Mawphlang (1500 m), 25. VI. 1995, leg. L. BARTOLOZZI & K. WERNER (at light).

A very widely distributed migrant species, flying in the entire Afrotropical, Oriental and Australian regions, as well as in part of the Palaearctic region: Canaries, North Africa, southern Europe, Middle East, Japan and Korea. It is widespread in India from North to South, mainly in open country. The recorded food plants in India are: *Vitis* (Vitaceae), *Spermacoce hispida* (Rubiaceae), *Boerhavia* (Nyctaginaceae), *Rumex* (Polygonaceae), *Caladium* (Araceae) (BELL & SCOTT 1937).

Theretra alecto (LINNÉ, 1758)

1 ♀, NE India: Meghalaya, East Khasi Hills, Mawphlang (1500 m), 25. VI. 1995, leg. L. BARTOLOZZI & K. WERNER (at light); 1 ♀, NE India: Meghalaya, East Khasi Hills, surrounding of Umloi (950 m), about 20 km NE Shillong, 28.-29. VI. 1995, leg. L. BARTOLOZZI & K. WERNER (at light).

This species is found from SE Europe and Egypt across the Middle East to India, Nepal, Myanmar (Burma), Sulawesi, the Moluccas, and Taiwan. In India it feeds on various plants as *Dillenia indica* (Dilleniaceae), *Saurauia nepalensis* (Ternstroemiaceae), *Vitis* and *Leea* (Vitaceae), *Psychotria* and *Rubia cordifolia* (Rubiaceae) (BELL & SCOTT 1937).

Theretra oldenlandiae (FABRICIUS, 1775)

2 ♂♂, 1 ♀, NE India: Meghalaya, East Khasi Hills, Mawphlang (1500 m), 25. VI. 1995, leg. L. BARTOLOZZI & K. WERNER (at light).

Distributed from western and eastern Himalaya to southern India and Sri Lanka, and eastbound to Myanmar (Burma), Japan, New Guinea, and the Solomon Islands. It is a common species living on a great number of food-

plants: *Corchorus capsularis* (Tiliaceae), *Impatiens* (Balsamiaceae), *Vitis* (Vitaceae), *Careya arborea* (Myrtaceae), *Jussiaea suffruticosa* (Onagraceae), *Oldenlandia corymbosa* (Rubiaceae), *Ipomaea batatus* (Convolvulaceae) and many plants of the family Araceae (BELL & SCOTT 1937). The caterpillars of this species, as well as those of *Theretra latreillei* and *Hippotion celerio,* are well known pests of grape vines (MOULDS 1981).

Theretra silhetensis (WALKER, 1856)

1 ♂, N India: Himachal Pradesh, Garsah, Kulu Valley (31°55' N, 77°04' E) (1350 m), IX.-X. 1982, leg. B. LANZA.

Another representative of the large genus *Theretra* HÜBNER, 1822, common in India from North to South and extending to Sri Lanka, Nepal, Myanmar (Burma), Malaysia, Indonesia and through the Australian tropics eastwards to Samoa. It feeds on *Jussiaea repens* (Onagraceae), *Boerhavia* (Nyctaginaceae) and various Araceae (BELL & SCOTT 1937).

Pergesa acteus (CRAMER, 1779)

1 ♀, NE India: Meghalaya, East Khasi Hills, surrounding of Umloi (950 m), about 20 km NE Shillong, 28.-29. VI. 1995, leg. L. BARTOLOZZI & K. WERNER (at light).

This species inhabits western and eastern Himalaya, southern India, Sri Lanka, Myanmar (Burma), southern China, the Philippines, Indonesia, the Moluccas and the Riu Kiu Islands. It is a common species feeding on a number of plants: *Vitis* (Vitaceae), *Begonia* (Begoniaceae), *Commelina* (Commelinaceae), *Arisaema, Amorphophallus, Colocasia, Caladium bicolor* and others of the family Araceae (Bell & Scott 1937).

Rhagastis velata (WALKER, 1867)

1 ♀, NE India: Meghalaya, E. Khasi Hills, surrounding of Umloi (ca. 950 m), ca. 20 km NE Shillong, 28.-29. VI. 1995, leg. L. BARTOLOZZI & K. WERNER (at light).

This is a common species in N India (Sikkim, Assam, Nepal, and Bhutan). It lives in well wooded areas in the Khasi Hills, up to about 1700 m. The larva feeds on *Arisaema* and *Amorphophallus* (Araceae) (BELL & SCOTT 1937).

Cechenena lineosa lineosa (WALKER, 1856)

4 ♀♀, NE India: Meghalaya, East Khasi Hills, Mawphlang (1500 m), 25. VI. 1995, leg. L. BARTOLOZZI & K. WERNER (at light).

This species is usually found in a green and a brown form. The nominotypical subspecies lives in western Himalaya (Mussooree, Dharmsala, Simla), eastern Himalaya (Nepal, Sikkim, Bhutan, Assam, Khasi Hills) and Myan-

mar (Burma). The subspecies *subangustata* ROTHSCHILD, 1920 is found in Malaysia, Sumatra and Borneo. The subspecies *scotti* ROTHSCHILD, 1920, described from W Himalaya, is merely an intermediate form between the green and the brown form (D'ABRERA 1986). Foodplants are: *Saurauia tristyla* (Ternstroemiaceae), *Impatiens* (Balsaminaceae), *Vitis* (Vitaceae) and *Polygonum chinensis* (Polygonaceae) (BELL & SCOTT 1937).

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